0054698 H1187

Eberline Services
W.O. No. R0-12-101-7596

Bechtel Hanford Inc.
SDG H1187

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1187 was composed of two other solid samples designated under SAF No. B99-029 with a Project Designation of: 100-HR-4 Pump & Treat-Resin Sampling.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on January 23, 2001.

2.0 ANALYSIS NOTES

2.1 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.4 Tritium Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion — 1/23/01

Melissa C. Mannion
Program Manager

Date

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1187

SAMPLE SUMMARY

SDG 7596
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1187

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B11335	100-KR-4	SOLID		R012101-01	B99-029	B99-029-64	12/13/00 08:28
B11336	100-KR-4	SOLID		R012101-02	B99-029	B99-029-64	12/13/00 08:40
Method Blank		SOLID		R012101-04	B99-029		
Lab Control Sample		SOLID		R012101-03	B99-029		
Duplicate (R012101-01)	100-KR-4	SOLID		R012101-05	B99-029		12/13/00 08:28

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/23/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1187

QC SUMMARY

SDG 7596
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1187

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7596	B99-029-64	B11335	SOLID	100.0			12/15/00	2	R012101-01	7596-001
		B11336	SOLID	100.0			12/15/00	2	R012101-02	7596-002
		Method Blank	SOLID						R012101-04	7596-004
		Lab Control Sample	SOLID						R012101-03	7596-003
		Duplicate (R012101-01)	SOLID	100.0			12/15/00	2	R012101-05	7596-005

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/23/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1187

PREP BATCH SUMMARY

SDG 7596
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1187

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
U	SOLID	Uranium, Isotopic in Soil	6963-016	5.0	2			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6963-016	10.0	2			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	6963-016	10.0	2			1	1	1/1		
Liquid Scintillation Counting												
H	SOLID	Tritium in Soil	6963-016	10.0	2			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/23/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1187

WORK SUMMARY

SDG 7596
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1187

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B11335			R012101-01	7596-001	H		01/10/01	01/23/01	MCM	Tritium in Soil
100-KR-4		SOLID	12/13/00	7596-001	SR		01/10/01	01/23/01	MCM	Total Strontium in Soil
B99-029-64	B99-029		12/15/00	7596-001	TC		01/17/01	01/23/01	MCM	Technetium 99 in Soil
				7596-001	U		01/12/01	01/23/01	MCM	Uranium, Isotopic in Soil
B11336			R012101-02	7596-002	H		01/10/01	01/23/01	MCM	Tritium in Soil
100-KR-4		SOLID	12/13/00	7596-002	SR		01/10/01	01/23/01	MCM	Total Strontium in Soil
B99-029-64	B99-029		12/15/00	7596-002	TC		01/15/01	01/23/01	MCM	Technetium 99 in Soil
				7596-002	U		01/12/01	01/23/01	MCM	Uranium, Isotopic in Soil
Method Blank			R012101-04	7596-004	H		01/10/01	01/23/01	MCM	Tritium in Soil
		SOLID		7596-004	SR		01/10/01	01/23/01	MCM	Total Strontium in Soil
	B99-029			7596-004	TC		01/15/01	01/23/01	MCM	Technetium 99 in Soil
				7596-004	U		01/12/01	01/23/01	MCM	Uranium, Isotopic in Soil
Lab Control Sample			R012101-03	7596-003	H		01/10/01	01/23/01	MCM	Tritium in Soil
		SOLID		7596-003	SR		01/10/01	01/23/01	MCM	Total Strontium in Soil
	B99-029			7596-003	TC		01/16/01	01/23/01	MCM	Technetium 99 in Soil
				7596-003	U		01/12/01	01/23/01	MCM	Uranium, Isotopic in Soil
Duplicate (R012101-01)			R012101-05	7596-005	H		01/10/01	01/23/01	MCM	Tritium in Soil
100-KR-4		SOLID	12/13/00	7596-005	SR		01/10/01	01/23/01	MCM	Total Strontium in Soil
	B99-029		12/15/00	7596-005	TC		01/15/01	01/23/01	MCM	Technetium 99 in Soil
				7596-005	U		01/12/01	01/23/01	MCM	Uranium, Isotopic in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
H	B99-029	Tritium in Soil	TRITIUM_COX_LSC	2			1	1	1	5
SR	B99-029	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	2			1	1	1	5
TC	B99-029	Technetium 99 in Soil	TC99_TR_SEP_LSC	2			1	1	1	5
U	B99-029	Uranium, Isotopic in Soil	UISO_PLATE_AEA	2			1	1	1	5
TOTALS				8			4	4	4	20

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/23/01

TMA / RICHMOND
SAMPLE DELIVERY GROUP H1187

R012101-04

Method Blank

METHOD BLANK

SDG	7596	Client/Case no	Hanford	SDG H1187	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R012101-04	Client sample id	Method Blank		
Dept sample id	7596-004	Material/Matrix		SOLID	
		SAF No	B99-029		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	2.10	2.9	4.8	400	U	H
Total Strontium	SR-RAD	0.076	0.19	0.38	1.0	U	SR
Technetium 99	14133-76-7	-0.195	0.20	0.70	15	U	TC
Uranium 233	U-233/234	-0.023	0.045	0.17	1.0	U	U
Uranium 235	15117-96-1	0.027	0.055	0.21	1.0	U	U
Uranium 238	U-238	0	0.045	0.17	1.0	U	U

100-KR-4 Pump & Treat-Resin Sampling

QC-BLANK 37153

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/23/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1187

R012101-03 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7596 Client/Case no Hanford SDG H1187

Contact Melissa C. Mannion Case no TRC-SBB-207925

Lab sample id R012101-03 Client sample id Lab Control Sample

Dept sample id 7596-003 Material/Matrix SOLID

SAF No B99-029

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	1410	18	4.9	400		H	1480	59	95	84-116	80-120
Total Strontium	23.6	0.66	0.20	1.0		SR	23.1	0.92	102	83-117	80-120
Technetium 99	132	4.0	1.4	15		TC	131	5.2	101	83-117	80-120
Uranium 233	17.7	1.8	0.89	1.0		U	19.3	0.77	92	83-117	80-120
Uranium 235	14.0	1.6	0.23	1.0		U	15.7	0.63	89	82-118	80-120
Uranium 238	19.8	2.0	0.85	1.0		U	21.0	0.84	94	83-117	80-120

100-KR-4 Pump & Treat-Resin Sampling

QC-LCS #37152

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/23/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1187

R012101-05 B11335

DUPLICATE

SDG	7596			Client/Case no	Hanford SDG H1187
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R012101-05	Lab sample id	R012101-01	Client sample id	B11335
Dept sample id	7596-005	Dept sample id	7596-001	Location/Matrix	100-KR-4 SOLID
		Received	12/15/00	Collected	12/13/00 08:28
% solids	100.0	% solids	100.0	Custody/SAF No	B99-029-64 B99-029

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	5.94	2.9	4.6	400	J	H	4.38	2.8	4.4	U	30	119
Total Strontium	-0.065	0.17	0.37	1.0	U	SR	-0.097	0.15	0.34	U	-	
Technetium 99	0.246	0.86	2.7	15	U	TC	0.244	0.48	1.5	U	-	
Uranium 233	0.118	0.095	0.18	1.0	U	U	0.049	0.098	0.19	U	-	
Uranium 235	0.029	0.057	0.22	1.0	U	U	0	0.059	0.23	U	-	
Uranium 238	0.071	0.094	0.18	1.0	U	U	0.024	0.049	0.19	U	-	

100-KR-4 Pump & Treat-Resin Sampling

QC-DUP#1 37154

DUPLICATES
Page 1
SUMMARY DATA SECTION
Page 9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/23/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1187

R012101-01 **B11335**

DATA SHEET

SDG	7596	Client/Case no	Hanford	SDG H1187	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R012101-01	Client sample id	B11335		
Dept sample id	7596-001	Location/Matrix	100-KR-4	SOLID	
Received	12/15/00	Collected	12/13/00 08:28		
% solids	100.0	Custody/SAF No	B99-029-64	B99-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	4.38	2.8	4.4	400	U	H
Total Strontium	SR-RAD	-0.097	0.15	0.34	1.0	U	SR
Technetium 99	14133-76-7	0.244	0.48	1.5	15	U	TC
Uranium 233	U-233/234	0.049	0.098	0.19	1.0	U	U
Uranium 235	15117-96-1	0	0.059	0.23	1.0	U	U
Uranium 238	U-238	0.024	0.049	0.19	1.0	U	U

100-KR-4 Pump & Treat-Resin Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/23/01

TMA / RICHMOND
SAMPLE DELIVERY GROUP H1187

R012101-02 B11336

DATA SHEET

SDG	7596	Client/Case no	Hanford SDG H1187
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R012101-02	Client sample id	B11336
Dept sample id	7596-002	Location/Matrix	100-KR-4 SOLID
Received	12/15/00	Collected	12/13/00 08:40
% solids	100.0	Custody/SAF No	B99-029-64 B99-029

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	10.6	3.2	4.8	400	J	H
Total Strontium	SR-RAD	0.065	0.17	0.34	1.0	U	SR
Technetium 99	14133-76-7	-0.010	0.36	1.2	15	U	TC
Uranium 233	U-233/234	0.053	0.11	0.20	1.0	U	U
Uranium 235	15117-96-1	0.032	0.064	0.24	1.0	U	U
Uranium 238	U-238	0	0.053	0.20	1.0	U	U

100-KR-4 Pump & Treat-Resin Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/23/01

Test U Matrix SOLID
SDG 7596
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1187

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1187

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 6963-016											
B11335	R012101-01			7596-001	U	U	U				
B11336	R012101-02			7596-002	U	U	U				
BLK (QC ID=37153)	R012101-04			7596-004	U	U	U				
LCS (QC ID=37152)	R012101-03			7596-003	ok	ok	ok				
Duplicate (R012101-01)	R012101-05			7596-005	- U	- U	- U				
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
100-KR-4 Pump & Treat-Resin Sampling								Averages			

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-016 2σ prep error 5.0 % Reference Lab Notebook 6963 pg. 016s																
B11335	R012101-01			0.23	0.500			93	102				30	01/12/01	01/12	SS-041
B11336	R012101-02			0.24	0.500			88	101				30	01/12/01	01/12	SS-043
BLK (QC ID=37153)	R012101-04			0.21	0.500			100	101					01/12/01	01/12	SS-045
LCS (QC ID=37152)	R012101-03			0.89	0.500			94	101					01/12/01	01/12	SS-044
Duplicate (R012101-01) (QC ID=37154)	R012101-05			0.22	0.500			97	101				30	01/12/01	01/12	SS-046
Nominal values and limits from method				1.0	0.500			20-105	100	100			180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-911	Uranium in Water and Dissolved Sample by Extraction Chromatography, rev 2
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.36 ± 0.60
YIELD 94 ± 9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/23/01

Test SR Matrix SOLID
SDG 7596
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1187

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1187

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 6963-016						
B11335	R012101-01			7596-001	U	
B11336	R012101-02			7596-002	U	
BLK (QC ID=37153)	R012101-04			7596-004	U	
LCS (QC ID=37152)	R012101-03			7596-003	ok	
Duplicate (R012101-01)	R012101-05			7596-005	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
100-KR-4 Pump & Treat-Resin Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-016	2σ prep error 10.0 %			Reference Lab Notebook 6963 pg. 016s												
B11335	R012101-01			0.34	1.02			84		100			28	01/10/01	01/10	GRB-231
B11336	R012101-02			0.34	1.00			80		100			28	01/10/01	01/10	GRB-232
BLK (QC ID=37153)	R012101-04			0.38	1.00			73		100				01/10/01	01/10	GRB-203
LCS (QC ID=37152)	R012101-03			0.20	1.00			79		200				01/10/01	01/10	GRB-229
Duplicate (R012101-01) (QC ID=37154)	R012101-05			0.37	1.02			77		100			28	01/10/01	01/10	GRB-204
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-502	Strontium in Solids, rev 2
	CP-519	Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 2

AVERAGES ± 2 SD	MDA	0.33	± 0.15
FOR 5 SAMPLES	YIELD	79	± 8

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/23/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1187

METHOD SUMMARY

TECHNETIUM 99 IN SOIL

BETA COUNTING

Test IC Matrix SOLID
SDG 7596
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1187

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99	
Preparation batch 6963-016						
B11335	R012101-01			7596-001	U	
B11336	R012101-02			7596-002	U	
BLK (QC ID=37153)	R012101-04			7596-004	U	
LCS (QC ID=37152)	R012101-03			7596-003	ok	
Duplicate (R012101-01)	R012101-05			7596-005	-	U
Nominal values and limits from method				RDLs (pCi/g)	15	
100-KR-4 Pump & Treat-Resin Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-016	2σ prep error 10.0 %			Reference Lab Notebook 6963 pg. 016s												
B11335	R012101-01			1.5	1.08			30	64				35	01/11/01	01/17	GRB-204
B11336	R012101-02			1.2	1.05			42	50				33	01/11/01	01/15	GRB-207
BLK (QC ID=37153)	R012101-04			0.70	1.00			76	50					01/11/01	01/15	GRB-207
LCS (QC ID=37152)	R012101-03			1.4	1.00			38	50					01/11/01	01/16	GRB-232
Duplicate (R012101-01) (QC ID=37154)	R012101-05			2.7	1.08			21	50				33	01/11/01	01/15	GRB-208
Nominal values and limits from method				15	1.00			20-105	50				180			

PROCEDURES	REFERENCE	
	TC99_TR_SEP_LSC	
	CP-060	Soil Preparation, rev 2
	CP-021	Preparation of Tc-99m Tracer, rev 0
	CP-002	Q.C. Preparation, rev 2
	CP-003	Tracing, rev 2
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 5 SAMPLES			
	MDA	1.5	± 1.5
	YIELD	41	± 42

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/23/01

Test H Matrix SOLID
SDG 7596
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1187

METHOD SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1187

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 6963-016						
B11335	R012101-01			7596-001	U	
B11336	R012101-02			7596-002	10.6	J
BLK (QC ID=37153)	R012101-04			7596-004	U	
LCS (QC ID=37152)	R012101-03			7596-003	ok	
Duplicate (R012101-01)	R012101-05			7596-005	ok	J
Nominal values and limits from method				RDLs (pCi/g)	400	
100-KR-4 Pump & Treat-Resin Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-016	2σ prep error 10.0 %			Reference Lab Notebook 6963 pg. 016s												
B11335	R012101-01			4.4	0.219			100		100			28	01/09/01	01/10	LSC-007
B11336	R012101-02			4.8	0.202			100		100			28	01/09/01	01/10	LSC-007
BLK (QC ID=37153)	R012101-04			4.8	0.200			100		100				01/09/01	01/10	LSC-007
LCS (QC ID=37152)	R012101-03			4.9	0.200			100		100				01/09/01	01/10	LSC-007
Duplicate (R012101-01) (QC ID=37154)	R012101-05			4.6	0.214			100		100			28	01/09/01	01/10	LSC-007
Nominal values and limits from method				400	0.200					25			180			

PROCEDURES	REFERENCE	TRITIUM_COX_LSC
	CP-060	Soil Preparation, rev 2
	CP-251	Tritium/Carbon-14 Oxidation, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 4.7 ± 0.40
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/23/01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-029-64	Page 1 of 1
Collector: Fahlberg	Company Contact: T Pickett; Telephone No.: 373-4630	Project Coordinator: TRENT, SJ	Price Code: 9N; Data Turnaround: 45 Days
Project Designation: 100-KR-4 Pump & Treat - Resin Sampling	Sampling Location: 100-KR-4 H1187 (7596)	SAF No.: B99-029	Air Quality ☐
Ice Chest No.: ERC 99-038 (1 of 1)	Field Logbook No.: EL 1517-1; COA: R10KR4C560	Method of Shipment: Fed EX	
Shipped To: (TMA)/RECRA	Offsite Property No.: A01058	Bill of Lading/Air Bill No.: 423537953-1312	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
** Historical data indicates that samples are less than 2000 pCi/g total activity.

Preservation	None	None	None	None	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	60mL	120mL	250mL	250mL	250mL	500mL		
SAMPLE ANALYSIS	Isotopic Uranium	Strontium-89,90 -- Total Sr	Technetium-99	Tritium - H3	~~Semi-VOA-8270A (PGL) (Bis(2-ethylhexyl) phthalate)~~	~~See item (1) in Special Instructions~~	~~IC Anions-300.0 (Nitrate)~~	~~See item (2) in Special Instructions~~	RT 12.14.00	

Sample No.	Matrix *	Sample Date	Sample Time									
B11335	OTHER SOLID	12/13/00	0828	X	X	X	X					
B11336	OTHER SOLID	12/13/00	0840	X	X	X	X					

CHAIN OF POSSESSION

Relinquished By	Date/Time	Sign/Print Names: Received By	Date/Time
R. Fahlberg / R. Fahlberg 12.13.00	1020	Received in Ref 2-B 12.13.00	1020
Relinquished By: Removed from Ref 2-B 3728 12.14.00	Date/Time 0815	Received By: R. Thorpe 12.14.00	Date/Time 0815
Relinquished By: R Thorpe 12.14.00	Date/Time 0815	Received By: FEDEX	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

~~(1) VOA-8260A (PGL) (Chloroform, Methylenechloride); VOA-8260A (Add-On) (Trichlorfluoromethane)~~
~~(2) Metals by ICP (PGLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Metals by ICP (PGLP) Add-on - 1311/6010 (Antimony, Beryllium, Nickel)~~

RT 12.14.00

Samples stored in Ref.# 2B at the 3728 Shipping Facility on 12/13/00
Collector not available to relinquish samples on 12/14/00 for shipment.

RT 12.14.00

Matrix *
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

ThermoRetec
Richmond Laboratory

Analytical Services

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: BechTel Hanford Date/Time received 12-15-00 11:40

CoC No. B99-029-64

Container I.D. No. ERC99038 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [✓]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [✓]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [✓]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [✓]	No [ ]	N/A [ ]
5.	Cooler Temperature: _____	Packing material is:	Wet [ ]	Dry [✓]
6.	Number of samples in shipping container: 2			
7.	Number of containers per sample: 4 (Or see CoC _____)			
8.	Paperwork agrees with samples?	Yes [✓]	No [ ]	
9.	Samples have: Tape [✓] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]			
10.	Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]			
11.	Describe any anomalies: _____			
13.	Was P.M. notified of any anomalies? Yes [✓]	No [ ]	Date 12-15-00	
14.	Received by [signature]	Date: 12-15-00	Time: 11:00	

Customer Sample No.	cpm	mr/hr	Customer Sample No.	Cpm	mr/hr

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1187

DATE RECEIVED: 12/15/00 RFW LOT # :0012L587

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11335						
% SOLIDS	001	SO	00L%S202	12/13/00	12/17/00	12/18/00
% SOLIDS	001 REP	SO	00L%S202	12/13/00	12/17/00	12/18/00
NITRATE BY IC	001	SO	00LIC081	12/13/00	12/20/00	12/20/00
NITRATE BY IC	001 REP	SO	00LIC081	12/13/00	12/20/00	12/20/00
NITRATE BY IC	001 MS	SO	00LIC081	12/13/00	12/20/00	12/20/00
TCLP	001	SO	00LTO144	12/13/00	12/27/00	12/28/00
B11336						
% SOLIDS	002	SO	00L%S202	12/13/00	12/17/00	12/18/00
NITRATE BY IC	002	SO	00LIC081	12/13/00	12/20/00	12/20/00
TCLP	002	SO	00LTO144	12/13/00	12/27/00	12/28/00
LAB QC:						
NITRATE BY IC	MB1	S	00LIC081	N/A	12/20/00	12/20/00
NITRATE BY IC	MB1 BS	S	00LIC081	N/A	12/20/00	12/20/00

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-029 H1187
RFW# : 0012L587

W.O. # : 10985-001-001-9999-00
Date Received: 12-15-00

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 2 solid samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperature was recorded on the chain-of-custody.

5. The method blank for Nitrate was within method criteria.

6. The Laboratory Control Sample (LCS) for Nitrate was within the laboratory control limits.

7. The matrix spike recovery for Nitrate was within the 75-125% control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. The results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

01-22-01
Date

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

njp\i12-587

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		__ 3060A/7196A	
Corrosivity __ by coupon __ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/ __ D5057-90		
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		9095A	

Other: Nitrate **Method:** EPA 300.0 (mod.)

Other: **Method**

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/29/00

CLIENT: TNUHANFORD B99-029 H1187 RECRA LOT #: 0012L587

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B11335	% Solids	45.3	%	0.01	1.0
		Nitrate by IC	7.2	MG/KG	2.8	1.0
-002	B11336	% Solids	45.3	%	0.01	1.0
		Nitrate by IC	7.3	MG/KG	2.8	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/29/00

CLIENT: TNUHANFORD B99-029 H1187 RECRA LOT #: 0012L587

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	00LIC081-MB1	Nitrate by IC	1.2 u	MG/KG	1.2	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 12/29/00

CLIENT: TNUHANFORD B99-029 H1187 RECRA LOT #: 0012L587

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B11335	Nitrate by IC	60	7.2	55	95.1	1.0
BLANK10	00LIC081-MB1	Nitrate by IC	24	1.2 u	25	97.0	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 12/29/00

CLIENT: TNUHANFORD B99-029 H1187 RECRA LOT #: 0012L587

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B11335	% Solids	45.3	45.3	0.066	1.0
		Nitrate by IC	7.2	6.7	6.9	1.0

RECRA LabNet Use Only

00121587

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU - Hanford B99-029

Est. Final Proj. Sampling Date

Project # 10986-001-001-9999-00

Project Contact/Phone #

RECRA Project Manager OJ

QC Spec Del Std TAT 30 day

Date Rec'd 12-15-00 Date Due 1-14-01

Account #

	A	B					C		D
Refrigerator #	1	6					6		6
#/Type Container Liquid									
#/Type Container Solid	1g	bg					1g		1g
Volume Liquid									250
Volume Solid	260	250					500		250
Preservatives	—						—		
ANALYSES REQUESTED	VOA	BNA	Pest/PCB	Herb	leachates		ICP Metal	CN	Anions

RECRA LabNet Use Only

MATRIX CODES:
- S - Soil
- SE - Sediment
- SO - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Drum Solids
- DL - Drum Liquids
- L - EP/TCLP Leachate
- WI - Wipe
- X - Other
- F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	OA24X	OA25X			Met①		ITCLP		ICNO3
001	B11335			SO	12/13/00	0828	X	X					X		X
002	B11336			SO	12/13/00	0840	X	X					X		X
003	B11335 tclp of 001			L	*	–					✓				
004	B11336 tclp of 002			L	*	–					✓				

Special Instructions:

DATE/REVISIONS:
1. Met① As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni
2. * See labchron
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # See Below
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.0 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
FedEx	D. [illegible]	12/15/00	10:00				

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 4235 7954 1323

COMPOSITE WASTE

ORIGINAL REWRITTEN

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-029-64	Page 1 of 1

Collector Fahlberg	Company Contact T Pickett	Telephone No. 373-4630	Project Coordinator TRENT, SJ
Project Designation 100-KR-4 Pump & Treat - Resin Sampling	Sampling Location 100-KR-4		SAF No. B99-029
Ice Chest No. ERC 99 2167 (10 ft)	Field Logbook No. EL 1517-1	COA R10KR4C560	Method of Shipment Fed EX
Shipped To TMA/RECRA	Offsite Property No. A010179		Bill of Lading/Air Bill No. 423579553 - 1323

Price Code 9N

Air Quality ☐

Data Turnaround **45 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
** Historical data indicates that samples are less than 2000 pCi/g total activity.

Preservation	None	None	None	None	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	60mL	120mL	250mL	250mL	250mL	500mL		
SAMPLE ANALYSIS	~~Isotopic Uranium~~	~~90Sr~~ Sr	~~Technetium-99~~ RT 12-14-00	~~Tritium~~	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate)	See item (1) in Special Instructions	IC Anions - 300.0 (Nitrate)	See item (2) in Special Instructions		

Sample No.	Matrix *	Sample Date	Sample Time										
B11335	OTHER SOLID	12/13/00	0828					X	X	X	X		
B11336	OTHER SOLID	12/13/00	0840					X	X	X	X		

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By R. Fahlberg / R. Fahlberg	1020 12·13·00	Received By Stored in Ref 2·B	1020 12·13·00
Relinquished By Removed from Ref 2B 3728	0815 12.14.00	Received By R. T. / R. Thoreen	0815 12.14.00
Relinquished By R. T. / R. Thoreen	0815 12.14.00	Received By FEDEX	
Relinquished By FedEx	12.15.00 / 10:00	Received By D. Smith	12.15.00 / 10:00
Relinquished By		Received By	
Relinquished By		Received By	

RT 12-14

SPECIAL INSTRUCTIONS

(1) VOA - 8260A (TCL) (Chloroform, Methylenechloride); VOA - 8260A (Add-On) [Trichloromonofluoromethane]
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Metals by ICP (TCLP) Add-on - 1311/6010 (Antimony, Beryllium, Nickel)

Samples stored in Ref.# 2B at the 3728 Shipping Facility on 12/13/00
Collector not available to relinquish samples on 12/14/00 for shipment.
RT 12/14/00

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

Lionville Laboratory Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1187

DATE RECEIVED: 12/15/00 RFW LOT # :0012L587

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TCLP LEACH	003	W	99L1861	12/28/00	12/28/00	12/31/00
SELENIUM, TCLP LEACH	003 REP	W	99L1861	12/28/00	12/28/00	12/31/00
SELENIUM, TCLP LEACH	003 MS	W	99L1861	12/28/00	12/28/00	12/31/00
B11336						
SILVER, TCLP LEACHAT	004	W	99L1861	12/28/00	12/28/00	12/31/00
ARSENIC, TCLP LEACHA	004	W	99L1861	12/28/00	12/28/00	12/31/00
BARIUM, TCLP LEACHAT	004	W	99L1861	12/28/00	12/28/00	12/31/00
BERYLLIUM, TCLP LEAC	004	W	99L1861	12/28/00	12/28/00	12/31/00
CADMIUM, TCLP LEACHA	004	W	99L1861	12/28/00	12/28/00	12/31/00
CHROMIUM, TCLP LEACH	004	W	99L1861	12/28/00	12/28/00	12/31/00
NICKEL, TCLP LEACHAT	004	W	99L1861	12/28/00	12/28/00	12/31/00
LEAD, TCLP LEACHATE	004	W	99L1861	12/28/00	12/28/00	12/31/00
ANTIMONY, TCLP LEACH	004	W	99L1861	12/28/00	12/28/00	12/31/00
SELENIUM, TCLP LEACH	004	W	99L1861	12/28/00	12/28/00	12/31/00
LAB QC:						
SILVER LABORATORY	LC1 BS	W	99L1861	N/A	12/28/00	12/31/00
SILVER, TCLP LEACHAT	MB1	W	99L1861	N/A	12/28/00	12/31/00
SILVER, TCLP LEACHAT	MB2	W	99L1861	N/A	12/28/00	12/31/00
ARSENIC LABORATORY	LC1 BS	W	99L1861	N/A	12/28/00	12/31/00
ARSENIC, TCLP LEACHA	MB1	W	99L1861	N/A	12/28/00	12/31/00
ARSENIC, TCLP LEACHA	MB2	W	99L1861	N/A	12/28/00	12/31/00
BARIUM LABORATORY	LC1 BS	W	99L1861	N/A	12/28/00	12/31/00
BARIUM, TCLP LEACHAT	MB1	W	99L1861	N/A	12/28/00	12/31/00
BARIUM, TCLP LEACHAT	MB2	W	99L1861	N/A	12/28/00	12/31/00
BERYLLIUM LABORATORY	LC1 BS	W	99L1861	N/A	12/28/00	12/31/00
BERYLLIUM, TCLP LEAC	MB1	W	99L1861	N/A	12/28/00	12/31/00
BERYLLIUM, TCLP LEAC	MB2	W	99L1861	N/A	12/28/00	12/31/00
CADMIUM LABORATORY	LC1 BS	W	99L1861	N/A	12/28/00	12/31/00
CADMIUM, TCLP LEACHA	MB1	W	99L1861	N/A	12/28/00	12/31/00
CADMIUM, TCLP LEACHA	MB2	W	99L1861	N/A	12/28/00	12/31/00
CHROMIUM LABORATORY	LC1 BS	W	99L1861	N/A	12/28/00	12/31/00
CHROMIUM, TCLP LEACH	MB1	W	99L1861	N/A	12/28/00	12/31/00
CHROMIUM, TCLP LEACH	MB2	W	99L1861	N/A	12/28/00	12/31/00
NICKEL LABORATORY	LC1 BS	W	99L1861	N/A	12/28/00	12/31/00

Lionville Laboratory Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1187

DATE RECEIVED: 12/15/00 RFW LOT # :0012L587

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NICKEL, TCLP LEACHAT	MB1	W	99L1861	N/A	12/28/00	12/31/00
NICKEL, TCLP LEACHAT	MB2	W	99L1861	N/A	12/28/00	12/31/00
LEAD LABORATORY	LC1 BS	W	99L1861	N/A	12/28/00	12/31/00
LEAD, TCLP LEACHATE	MB1	W	99L1861	N/A	12/28/00	12/31/00
LEAD, TCLP LEACHATE	MB2	W	99L1861	N/A	12/28/00	12/31/00
ANTIMONY LABORATORY	LC1 BS	W	99L1861	N/A	12/28/00	12/31/00
ANTIMONY, TCLP LEACH	MB1	W	99L1861	N/A	12/28/00	12/31/00
ANTIMONY, TCLP LEACH	MB2	W	99L1861	N/A	12/28/00	12/31/00
SELENIUM LABORATORY	LC1 BS	W	99L1861	N/A	12/28/00	12/31/00
SELENIUM, TCLP LEACH	MB1	W	99L1861	N/A	12/28/00	12/31/00
SELENIUM, TCLP LEACH	MB2	W	99L1861	N/A	12/28/00	12/31/00

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B99-029
RFW#: 0012L587
SDG/SAF#: H1187/B99-029

W.O.#: 10985-001-001-9999-00
Date Received: 12-15-00

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 TCLP leachate samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to form 7.

10. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

11. The TCLP extract from sample B11335 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

14. As of January 27, 2001, Recra LabNet Philadelphia became Lionville Laboratory Inc.. Some forms may still reference Recra LabNet Philadelphia.

02-01-01

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory
Date

gmb/m12-587

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0012L587

Leaching Procedure: __1310 ✓1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A ✓3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B	__200.7			__99
Antimony	✓6010B __7041 [5]	__200.7 __204.2			__99
Arsenic	✓6010B __7060A [5]	__200.7 __206.2	__3113B		__99
Barium	✓6010B	__200.7			__99
Beryllium	✓6010B	__200.7			__99
Bismuth	__6010B [1]	__200.7 [1]		__1620	__99
Boron	__6010B	__200.7			__99
Cadmium	✓6010B __7131A [5]	__200.7 __213.2			__99
Calcium	__6010B	__200.7			__99
Chromium	✓6010B __7191 [5]	__200.7 __218.2			__SS17
Cobalt	__6010B	__200.7			__99
Copper	__6010B __7211 [5]	__200.7 __220.2			__99
Iron	__6010B	__200.7			__99
Lead	✓6010B __7421 [5]	__200.7 __239.2	__3113B		__99
Lithium	__6010B __7430 [4]	__200.7		__1620	__99
Magnesium	__6010B	__200.7			__99
Manganese	__6010B	__200.7			__99
Mercury	__7470A [3] __7471A [3]	__245.1 [2] __245.5 [2]			__99
Molybdenum	__6010B	__200.7			__99
Nickel	✓6010B	__200.7			__99
Potassium	__6010B __7610 [4]	__200.7 __258.1 [4]			__99
Rare Earths	__6010B [1]	__200.7 [1]		__1620	__99
Selenium	✓6010B __7740 [5]	__200.7 __270.2	__3113B		__99
Silicon	__6010B [1]	__200.7		__1620	__99
Silica	__6010B	__200.7		__1620	__99
Silver	✓6010B __7761 [5]	__200.7 __272.2			__99
Sodium	__6010B __7770 [4]	__200.7 __273.1 [4]			__99
Strontium	__6010B	__200.7			__99
Thallium	__6010B __7841 [5]	__200.7 __279.2 __200.9			__99
Tin	__6010B	__200.7			__99
Titanium	__6010B	__200.7			__99
Uranium	__6010B [1]	__200.7 [1]		__1620	__99
Vanadium	__6010B	__200.7			__99
Zinc	__6010B	__200.7			__99
Zirconium	__6010B [1]	__200.7 [1]		__1620	__99

Other:_____ Method:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

Lionville Laboratory

INORGANICS DATA SUMMARY REPORT 01/30/01

CLIENT: TNUHANFORD B99-029 H1187 RECRA LOT #: 0012L587

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B11335	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	33.9	u	UG/L	33.9	1.0
		Barium, TCLP Leachate	4.0		UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	2870		UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0
-004	B11336	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	45.0		UG/L	33.9	1.0
		Barium, TCLP Leachate	9.3		UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	1360		UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0

Lionville Laboratory

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/30/01

CLIENT: TNUHANFORD B99-029 H1187 RECRA LOT #: 0012L587

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1861-MB1	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	33.9	u	UG/L	33.9	1.0
		Barium, TCLP Leachate	3.0	u	UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	4.9	u	UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0
BLANK2	99L1861-MB2	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	33.9	u	UG/L	33.9	1.0
		Barium, TCLP Leachate	4.1		UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	4.9	u	UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0

Lionville Laborator

INORGANICS ACCURACY REPORT 01/30/01

CLIENT: TNUHANFORD B99-029 H1187 RECRA LOT #: 0012L587

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	B11335	Silver, TCLP Leachate	3240	2.5 u	5000	64.7	1.0
		Arsenic, TCLP Leachate	5000	33.9 u	5000	100.0	1.0
		Barium, TCLP Leachate	99400	4.0	100000	99.4	1.0
		Beryllium, TCLP Leacha	908	0.60u	1000	90.8	1.0
		Cadmium, TCLP Leachate	954	3.4 u	1000	95.4	1.0
		Chromium, TCLP Leachat	7350	2870	5000	89.7	1.0
		Nickel, TCLP Leachate	952	12.5 u	1000	95.2	1.0
		Lead, TCLP Leachate	4850	25.0 u	5000	97.0	1.0
		Antimony, TCLP Leachat	702	17.0 u	1000	70.2	1.0
		Selenium, TCLP Leachat	1030	62.3 u	1000	103.1	1.0

Lionville Laborator

INORGANICS PRECISION REPORT 01/30/01

CLIENT: TNUHANFORD B99-029 H1187 RECRA LOT #: 0012L587

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-003REP	B11335	Silver, TCLP Leachate	2.5 u	2.5 u	NC	1.0
		Arsenic, TCLP Leachate	33.9 u	42.1	NC 200	1.0
		Barium, TCLP Leachate	4.0	4.7	16.1	1.0
		Beryllium TCLP Leachate	0.60u	0.60u	NC	1.0
		Cadmium, TCLP Leachate	3.4 u	3.4 u	NC	1.0
		Chromium, TCLP Leachate	2870	2640	8.2	1.0
		Nickel, Leachate	12.5 u	12.5 u	NC	1.0
		Lead, TCLP Leachate	25.0 u	25.0 u	NC	1.0
		Antimony, Leachate	17.0 u	17.0 u	NC	1.0
		Selenium, TCLP Leachate	62.3 u	62.3 u	NC	1.0

WJB 1/31/01

Lionville Laborator

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/30/01

CLIENT: TNUHANFORD B99-029 H1187 RECRA LOT #: 0012L587

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1861-LC1	Silver, LCS	485	500	UG/L	97.0
		Arsenic, LCS	10100	10000	UG/L	101.1
		Barium, LCS	4710	5000	UG/L	94.1
		Beryllium, LCS	243	250	UG/L	97.2
		Cadmium, LCS	252	250	UG/L	100.6
		Chromium, LCS	499	500	UG/L	99.9
		Nickel, LCS	2000	2000	UG/L	100.1
		Lead, LCS	2550	2500	UG/L	102.1
		Antimony, LCS	3020	3000	UG/L	100.7
		Selenium, LCS	10000	10000	UG/L	100.4

RECRA LabNet Use Only: 00121587

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: INU - Hanford B99-029
Est. Final Proj. Sampling Date:
Project #: 10986-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 12-15-00 Date Due: 1-14-01
Account #:

	A	B					C		D
Refrigerator #	1	6					6		6
#/Type Container – Liquid									1az
#/Type Container – Solid	1az	1az					1az		1az
Volume – Liquid									250
Volume – Solid	250	250					500		250
Preservatives	—						—		
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb		1 Leachates	INORG: ICP Metal	CN	Se Anions ...

RECRA LabNet Use Only

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	0624X	0625X	Met(1)	ITCLP	ICNO3
001	B11335			SO	12/13/00	0828	X	X		X	X
002	B11336			SO	12/13/00	0840	X	X		X	X
003	B11335 tclp of 001			L	*	—			✓		
004	B11336 tclp of 002			L	*	—			✓		

Special Instructions:

DATE/REVISIONS:
Met(1) 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni
* 2. See labchron
3.
4.
5.
6.

RECRA LabNet Use Only
Samples were: 1) Shipped ✓ or Hand Delivered ___
Airbill # See Below
2) Ambient or Chilled (circled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.0 °C

Relinquished by	Received by	Date	Time
FedEx	D Amit	12/15/00	10:00

Relinquished by	Received by	Date	Time
COMPOSITE	ORIGINAL		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 4235 7954 1323

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-029-64	Page 1 of 1

Collector: Fahlberg	Company Contact: T Pickett; Telephone No.: 373-4630	Project Coordinator: TRENT, SJ	Price Code 9N; Data Turnaround 45 Days
Project Designation: 100-KR-4 Pump & Treat - Resin Sampling	Sampling Location: 100-KR-4	SAF No.: B99-029	Air Quality ☐
Ice Chest No. ERC 99067 (1 of 1)	Field Logbook No.: EL 1517-1; COA: R10KR4C560	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA	Offsite Property No. A010179	Bill of Lading/Air Bill No. 4235795 3-1323	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
** Historical data indicates that samples are less than 2000 pCi/g total activity.

Preservation	None	None	None	None	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	60mL	120mL	250mL	250mL	250mL	500mL		
SAMPLE ANALYSIS	~~[illegible]~~	~~[illegible] Sr~~	~~[illegible]~~ RT 12-14-00	~~[illegible]~~	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate)	See item (1) in Special Instructions.	IC Anions - 300.0 (Nitrate)	See item (2) in Special Instructions.		

Sample No.	Matrix *	Sample Date	Sample Time										
B11335	OTHER SOLID	12/13/00	0828					X	X	X	X		
B11336	OTHER SOLID	12/13/00	0840					X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	1020 12-13-00	Stored in Ref 2-B	1020 12-13-00
Removed from Ref 2B 3728 (RT 12-14)	0815 12.14.00	R. Thewer	0815 12.14.00
R Thewer	0815 12.14.00	FEDEX	
FedEx	12.15.00 / 10:00	D Smith	12.15.00 / 10:00

SPECIAL INSTRUCTIONS

(1) VOA - 8260A (TCL) (Chloroform, Methylenechloride); VOA - 8260A (Add-On) (Trichloromonofluoromethane)
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Metals by ICP (TCLP) Add-on - 1311/6010 (Antimony, Beryllium, Nickel)

Samples stored in Ref.# 2B at the 3728 Shipping Facility on 12/13/00
Collector not available to relinquish samples on 12/14/00 for shipment.
RT 12/14/00

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

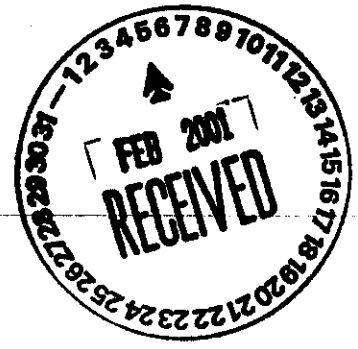
LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1187

DATE RECEIVED: 12/15/00 RFW LOT # :0012L587

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11335	001	SO	00LE1667	12/13/00	12/18/00	01/05/01
B11335	001 R1	SO	01LE0030	12/13/00	01/10/01	01/13/01
B11335	001 MS	SO	00LE1667	12/13/00	12/18/00	01/05/01
B11335	001 MS R1	SO	01LE0030	12/13/00	01/10/01	01/12/01
B11335	001 MSD	SO	00LE1667	12/13/00	12/18/00	01/05/01
B11335	001 MSD R1	SO	01LE0030	12/13/00	01/10/01	01/13/01
B11336	002	SO	00LE1667	12/13/00	12/18/00	01/09/01
LAB QC:						
SBLKKT	MB1	S	00LE1667	N/A	12/18/00	01/05/01
SBLKKT	MB1 BS	S	00LE1667	N/A	12/18/00	01/05/01
SBLKMD	MB1	S	01LE0030	N/A	01/10/01	01/13/01
SBLKMD	MB1 BS	S	01LE0030	N/A	01/10/01	01/13/01



LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B99-029
RFW #: 0012L587
SDG/SAF #: H1187/ B99-029

W.O. #: 10985-001-001-9999-00
Date Received: 12-15-2000

SEMIVOLATILE

Two (2) solid samples were collected on 12-13-2000.

The samples and their associated QC samples were extracted on 12-18-2000, re-extracted on 01-10-2001 and analyzed according to criteria set forth in Lionville laboratory OPs based on SW 846 Method 8270C for client specified Semivolatile target compound Bis(2-Ethylhexyl)phthalate on 01-05,09,12,13-2001.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The samples were extracted and analyzed within required holding times.

3. All surrogate recoveries were within EPA QC limits.

4. All blank spike recoveries were within EPA QC limits.

5. Six (6) of twenty-four (24) matrix spike recoveries were outside EPA QC limits. The target compound is not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.)

6. The method blank (00LE1667-MB1) contained the common laboratory contaminant Bis(2-Ethylhexyl)phthalate at a level greater than 3x the CRQL. The associated sample analysis for B11335 and its associated QC yielded levels of Bis(2-Ethylhexyl)phthalate that exceeded the calibration range and were probable laboratory contamination. This sample and the matrix QC were re-extracted on 01-10-2001, analyzed on 01-12,13-2001, and reported. The compound Bis(2-Ethylhexyl)phthalate was not detected above the CRQL in the re-extracted analyses.

7. Internal standard area criteria were not met for sample B11335 MS RE. The initial analysis fulfills the reanalysis requirement.

8. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

9. As of January 27, 2001, Recra LabNet Philadelphia became Lionville Laboratory Inc. Some Forms may still reference Recra LabNet Philadelphia.

by J. Michael Taylor
President
Lionville Laboratory Inc.

02-01-01
Date

som\group\data\bna\tnu-hanford-12-587.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

RECRA **Sample Discrepancy Report (SDR)** SDR #: 01MS021

Initiator: S Layman Batch: 00121587 Parameter: BNA
Date: 1-10-01 & 1-10-01 Samples: 001 Matrix: Soil
Client: INV Hanford Method: SW846/MCAWW/CLP/ Prep Batch: 00LE1667

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)

Bis(phthalate) contamination in Blank at approx 4XCRQL.
Bis(phthalate) in 001, 001MS above calibration range, but not as high in MSD

2. Known or Probable Causes(s) (To be used for trend analysis)

__ Lack of Organization
__ Lack of Training
__ Lack of Discipline
__ Lack of Resources
__ Lack of Time
__ Lack of Management Support
__ Other (Please explain):

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
✓ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:
002 - none detected. - narrate
Reextract 001 & MS, MSD

4. Project Manager Instructions...signature/date: [signature] 1/10/01

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: DAL 1/25/01

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA for distribution and filing.

Route/Distribution of SDR	Route	Distribution of Completed SDR
__ Initiator	__	Metals: Doughty
__ Lab Manager: M. Taylor	__	Inorganic: Perrone
__ Project Mgr: Stone/Carey/Johnson	__	GC/LC: Pastor
__ Section Mgr: Wesson/Daniels	__	MS: Layman/Rycklak
X QA (file): Schrenkel	__	Log-in: Keppel
__ *Data Management:* Feldman	__	*Admin:* Soos
__ Sample Prep: Bickel/Kauffman	__	Other: _____

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

		Cust ID:	B11335	B11335	B11335	B11335	B11335	B11335
Sample Information		RFW#:	001	001	001 MS	001 MS	001 MSD	001 MSD
		Matrix:	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
		D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
		Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
				REPREP		REPREP		REPREP
Surrogate Recovery	Nitrobenzene-d5		66 %	64 %	54 %	60 %	39 %	50 %
	2-Fluorobiphenyl		58 %	52 %	49 %	52 %	35 %	48 %
	p-Terphenyl-d14		91 %	98 %	71 %	86 %	57 %	88 %
bis(2-Ethylhexyl)phthalate			12000 E	170 J	11000 E	84 J	3900 B	160 J

		Cust ID:	B11336	SBLKKT	SBLKKT BS	SBLKMD	SBLKMD BS
Sample Information		RFW#:	002	00LE1667-MB1	00LE1667-MB1	01LE0030-MB1	01LE0030-MB1
		Matrix:	SOLID	SOIL	SOIL	SOIL	SOIL
		D.F.:	1.00	1.00	1.00	1.00	1.00
		Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5		65 %	53 %	78 %	79 %	82 %
	2-Fluorobiphenyl		60 %	54 %	77 %	81 %	83 %
	p-Terphenyl-d14		106 %	77 %	115 %	103 %	98 %
bis(2-Ethylhexyl)phthalate			720 U	1300	460 B	330 U	330 U

*= Outside of EPA CLP QC limits.

3D

SOIL SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet Contract: 0985-01-01

Case No.: TNUHANFORD_B99-029_H1187 RFW Lot No.: 0012L587

BLANK Spike - Sample No.: SBLKKTLE1667-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	BS CONCENTRATION UG/KG	BS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	1670	0	787	47	28 -104
N-Nitroso-Di-n-propylamine	1670	0	824	49	41 -126
1,2,4-Trichlorobenzene	1670	0	805	48	38 -107
Acenaphthene	1670	0	881	53	31 -137
2,4-Dinitrotoluene	1670	0	903	54	28 -89
Pyrene	1670	0	1050	63	35 -142

Column to be used to flag recovery value with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS:

3D

SOIL SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet Contract: 0985-01-01

Case No.: TNUHANFORD B99-029 H1187 RFW Lot No.: 0012L587

BLANK Spike - Sample No.: SBLKMDLE0030-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	BS CONCENTRATION UG/KG	BS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	1670	0	1260	76	28 -104
N-Nitroso-Di-n-propylamine	1670	0	1430	86	41 -126
1,2,4-Trichlorobenzene	1670	0	1350	81	38 -107
Acenaphthene	1670	0	1290	78	31 -137
2,4-Dinitrotoluene	1670	0	1220	73	28 -89
Pyrene	1670	0	1480	89	35 -142

Column to be used to flag recovery value with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS:

3D

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNet Contract: 0985-01-01

Case No.: TNUHANFORD B99-029 H1187 RFW Lot No.: 0012L587-001

MATRIX Spike - Sample No.: B11335 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	3660	0	1880	52	28 -104
N-Nitroso-Di-n-propylamine	3660	0	2450	67	41 -126
1,2,4-Trichlorobenzene	3660	0	2090	57	38 -107
Acenaphthene	3660	0	2320	64	31 -137
2,4-Dinitrotoluene	3660	0	2210	60	28 -89
Pyrene	3660	0	2390	65	35 -142

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
1,4-Dichlorobenzene	3600	758	21 *	86 *	27	28 -104
N-Nitroso-Di-n-propylamine	3600	1050	29 *	79 *	38	41 -126
1,2,4-Trichlorobenzene	3600	835	23 *	85 *	23	38 -107
Acenaphthene	3600	986	27 *	82 *	19	31 -137
2,4-Dinitrotoluene	3600	834	23 *	90 *	47	28 -89
Pyrene	3600	1040	29 *	76 *	36	35 -142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 6 out of 6 outside limits
Spike Recovery: 6 out of 12 outside limits

COMMENTS:

3D

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNet Contract: 0985-01-01

Case No.: TNUHANFORD B99-029 H1187 RFW Lot No.: 0012L587-001

MATRIX Spike - Sample No.: B11335RE Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	4400	0	2400	55	28 -104
N-Nitroso-Di-n-propylamine	4400	0	3960	90	41 -126
1,2,4-Trichlorobenzene	4400	0	2450	56	38 -107
Acenaphthene	4400	0	2620	60	31 -137
2,4-Dinitrotoluene	4400	0	2990	68	28 -89
Pyrene	4400	0	2800	64	35 -142

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
1,4-Dichlorobenzene	4420	2240	51	7	27	28 -104
N-Nitroso-Di-n-propylamine	4420	3390	77	15	38	41 -126
1,2,4-Trichlorobenzene	4420	2440	55	1	23	38 -107
Acenaphthene	4420	2620	59	1	19	31 -137
2,4-Dinitrotoluene	4420	3120	71	4	47	28 -89
Pyrene	4420	3050	69	7	36	35 -142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 6 outside limits
Spike Recovery: 0 out of 12 outside limits

COMMENTS:

2

RECRA LabNet Use Only: 00121587

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - Hanford 399-029
Est. Final Proj. Sampling Date:
Project #: 10986-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 12-15-00 Date Due: 1-14-01
Account #:

	A	B					C		D
Refrigerator #	1	6					6		6
#/Type Container – Liquid									1og
#/Type Container – Solid	1og	1og					1og		1og DS 12/15/00
Volume – Liquid									250
Volume – Solid	250	250					500		250
Preservatives	—						—		
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb	TCLP/done		INORG: ICP Metal	CN	56 Anions SO_4 NO_3
RECRA LabNet Use Only	OL24X	OL25X			Met①		ITCLP		ICNO3

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA (OL24X)	BNA (OL25X)	Pest/PCB	Herb	TCLP (Met①)	ICP Metal (ITCLP)	CN	Anions (ICNO3)
001	B11335			SO	12/13/00	0828	X	X				X		X
002	B11336			SO	12/13/00	0840	X	X				X		X
003	B11335 tclp of 001			L	*	–					✓			
004	B11336 tclp of 002			L	*	–					✓			

Special Instructions:

DATE/REVISIONS:
Met① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni
* 2. See labchron
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # See Below
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.0 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	D. [signature]	12/15/00	10:00				

COMPOSITE WASTE ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 4235 7954 1323

13

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-029-64	Page 1 of 1

Collector Fahlberg	**Company Contact** T Pickett / **Telephone No.** 373-4630	**Project Coordinator** TRENT, SJ	**Price Code** 9N / **Data Turnaround** 45 Days
Project Designation 100-KR-4 Pump & Treat - Resin Sampling	**Sampling Location** 100-KR-4	**SAF No.** B99-029	**Air Quality** ☐
Ice Chest No. ERC 99267 (10f1)	**Field Logbook No.** EL 1517-1 / **COA** R10KR4C560	**Method of Shipment** Fed EX	
Shipped To TMA/RECRA	**Offsite Property No.** A010179	**Bill of Lading/Air Bill No.** 4235795[illegible] - 1323	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
** Historical data indicates that samples are less than 2000 pCi/g total activity.

Preservation	None	None	None	None	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	60mL	120mL	250mL	250mL	250mL	500mL		
SAMPLE ANALYSIS	~~[illegible]~~	~~[illegible]~~ Sr	~~[illegible]~~ RT 12-14-00	~~[illegible]~~	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate)	See item (1) in Special Instructions.	IC Anions - 300.0 (Nitrate)	See item (2) in Special Instructions.		

Sample No.	Matrix *	Sample Date	Sample Time										
B11335	OTHER SOLID	12/13/00	0828					X	X	X	X		
B11336	OTHER SOLID	12/13/00	0840					X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	12-13-00 1020	Stored in Ref 2-B	12-13-00 1020
Removed from Ref 2B 3728 (RT 12-14)	12-14-00 0815	R. T. / R. Thevert	12-14-00 0815
R. T. / R. Thevert	12-14-00 0815	FEDEX	
FedEx	12-15-00 / 10:00	D. Smith	12-15-00 / 10:00

SPECIAL INSTRUCTIONS

(1) VOA - 8260A (TCL) (Chloroform, Methylenechloride); VOA - 8260A (Add-On) (Trichloromonofluoromethane)
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Metals by ICP (TCLP) Add-on - 1311/6010 (Antimony, Beryllium, Nickel)

Samples stored in Ref.# 3B at the 3728
Shipping Facility on 12/13/00
Collector not available to relinquish samples
on 12/14/00 for shipment.
RT 12/14/00

Matrix *
S=Soil
SE=Sediment
SO=Solid
S =Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	*Disposal Method*	*Disposed By*	Date/Time

Figure 1. Sample Check-in List

Date/Time Received: 12.15.00 | 10:00

SDG#: CC12L587

Work Order Number: _____ SAF# B99-029

Shipping Container ID: ERC 99-007 Chain of Custody # B99-029-64

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 20°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 8
7. Sample holding times exceeded? Yes [ ] No [✓]

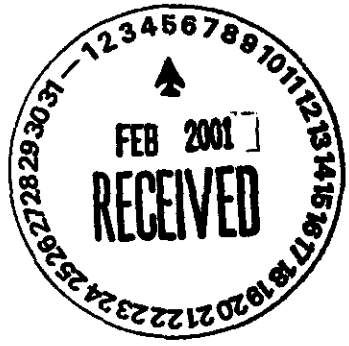
8. Samples have:
   - ____ tape
   - ____ hazard labels
   - ✓ custody seals
   - ✓ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [ ]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: [signature] / BECRA Date: 12.15.00

Telephoned to: _____ On _____ By _____



Lionville Laboratory Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1187

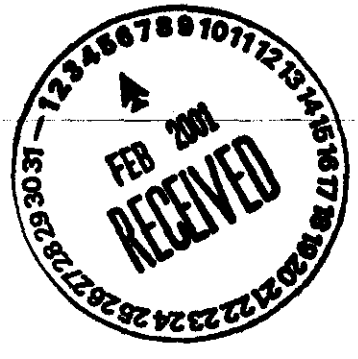
DATE RECEIVED: 12/15/00 RFW LOT # :0012L587

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11335						
TCLP	001	SO	00LTO144	12/13/00	12/27/00	12/28/00
B11336						
TCLP	002	SO	00LTO144	12/13/00	12/27/00	12/28/00
B11335						
SILVER, TCLP LEACHAT	003	W	99L1861	12/28/00	12/28/00	12/31/00
SILVER, TCLP LEACHAT	003 REP	W	99L1861	12/28/00	12/28/00	12/31/00
SILVER, TCLP LEACHAT	003 MS	W	99L1861	12/28/00	12/28/00	12/31/00
ARSENIC, TCLP LEACHA	003	W	99L1861	12/28/00	12/28/00	12/31/00
ARSENIC, TCLP LEACHA	003 REP	W	99L1861	12/28/00	12/28/00	12/31/00
ARSENIC, TCLP LEACHA	003 MS	W	99L1861	12/28/00	12/28/00	12/31/00
BARIUM, TCLP LEACHAT	003	W	99L1861	12/28/00	12/28/00	12/31/00
BARIUM, TCLP LEACHAT	003 REP	W	99L1861	12/28/00	12/28/00	12/31/00
BARIUM, TCLP LEACHAT	003 MS	W	99L1861	12/28/00	12/28/00	12/31/00
BERYLLIUM, TCLP LEAC	003	W	99L1861	12/28/00	12/28/00	12/31/00
BERYLLIUM, TCLP LEAC	003 REP	W	99L1861	12/28/00	12/28/00	12/31/00
BERYLLIUM, TCLP LEAC	003 MS	W	99L1861	12/28/00	12/28/00	12/31/00
CADMIUM, TCLP LEACHA	003	W	99L1861	12/28/00	12/28/00	12/31/00
CADMIUM, TCLP LEACHA	003 REP	W	99L1861	12/28/00	12/28/00	12/31/00
CADMIUM, TCLP LEACHA	003 MS	W	99L1861	12/28/00	12/28/00	12/31/00
CHROMIUM, TCLP LEACH	003	W	99L1861	12/28/00	12/28/00	12/31/00
CHROMIUM, TCLP LEACH	003 REP	W	99L1861	12/28/00	12/28/00	12/31/00
CHROMIUM, TCLP LEACH	003 MS	W	99L1861	12/28/00	12/28/00	12/31/00
NICKEL, TCLP LEACHAT	003	W	99L1861	12/28/00	12/28/00	12/31/00
NICKEL, TCLP LEACHAT	003 REP	W	99L1861	12/28/00	12/28/00	12/31/00
NICKEL, TCLP LEACHAT	003 MS	W	99L1861	12/28/00	12/28/00	12/31/00
LEAD, TCLP LEACHATE	003	W	99L1861	12/28/00	12/28/00	12/31/00
LEAD, TCLP LEACHATE	003 REP	W	99L1861	12/28/00	12/28/00	12/31/00
LEAD, TCLP LEACHATE	003 MS	W	99L1861	12/28/00	12/28/00	12/31/00
ANTIMONY, TCLP LEACH	003	W	99L1861	12/28/00	12/28/00	12/31/00
ANTIMONY, TCLP LEACH	003 REP	W	99L1861	12/28/00	12/28/00	12/31/00
ANTIMONY, TCLP LEACH	003 MS	W	99L1861	12/28/00	12/28/00	12/31/00

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-029 H1187

DATE RECEIVED: 12/15/00 RFW LOT # :0012L587

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B11335	001	SO	00LVX547	12/13/00	N/A	12/23/00
B11335	001 MS	SO	00LVX548	12/13/00	N/A	12/26/00
B11335	001 MSD	SO	00LVX550	12/13/00	N/A	12/27/00
B11336	002	SO	00LVX547	12/13/00	N/A	12/23/00
LAB QC:						
VBLKJJ	MB1	S	00LVX547	N/A	N/A	12/23/00
VBLKJJ	MB1 BS	S	00LVX547	N/A	N/A	12/23/00
VBLKFG	MB1	S	00LVX548	N/A	N/A	12/26/00
VBLKFG	MB1 BS	S	00LVX548	N/A	N/A	12/26/00
VBLKJP	MB1	S	00LVX550	N/A	N/A	12/27/00
VBLKJP	MB1 BS	S	00LVX550	N/A	N/A	12/27/00



LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B99-029
RFW #: 0012L587
SDG/SAF #: H1187/B99-029

W.O. #: 10985-001-001-9999-00
Date Received: 12-15-2000

GC/MS VOLATILE

Two (2) solid samples were collected on 12-13-2000.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville laboratory OPs based on SW 846 Method 8260A for the client specified Volatile target compounds on 12-23,26,27-2000.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. All samples were analyzed within required holding time.

3. Two (2) of thirty (30) obtainable surrogate recoveries were outside EPA QC limits. The surrogate recovery criteria were not met for samples B11335 and B11336. The surrogate recovery criteria for Toluene-d8 was biased high in sample B11336; however, there were no target compounds detected at a significant level. The sample was not reanalyzed. The analysis of associated matrix spike samples fulfills the reanalysis requirement of B11335. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

4. Two (2) of ten (10) matrix spike recoveries were outside EPA QC limits.

   The target compound is not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.)

5. All blank spike recoveries were within EPA QC limits.

6. The method blanks contained the common laboratory contaminant Methylene Chloride at levels less than 2x the CRQL.

7. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

8. As of January 27, 2001, Recra LabNet Philadelphia became Lionville Laboratory Inc. Some Forms may still reference Recra LabNet Philadelphia.

for J. Michael Taylor
President
Lionville laboratory Inc.

02-01-01
Date

som\group\data\vos\tnu-hanford-12-587.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

RECRA Sample Discrepancy Report (SDR) SDR #: 01VT031

Initiator: B. Rubino Batch: 0012L587 Parameter: MS VOA
Date: 1/19/01 Samples: 002 Matrix: SOLID
Client: INU Hanford B99-029 Method: SW846/MCAWW/CLP/ Prep Batch: _____

1. Reason for SDR

a. COC Discrepancy
__ Tech Profile Error __ Client Request __ Sampler Error on C-O-C
__ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy
__ Missing Sample/Extract __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)
Sample 0012L587-002 had the surrogate Toluene d8 outside criteria (REC=161% Limit=140%)

2. Known or Probable Causes(s) (To be used for trend analysis)
__ Lack of Organization
__ Lack of Training
__ Lack of Discipline
__ Lack of Resources
__ Lack of Time
__ Lack of Management Support
__ Other (Please explain): Sample was not reanalyzed. Sample was amber pellets.

3. Discussion and Proposed Action Other Description:
__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)
Report; Narrate.

4. Project Manager Instructions...signature/date: [signature] 1/19/01
__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: Brent Rubino 1/19/01 Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
X Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA for distribution and filing.

Route	Distribution of SDR	Route	Distribution of Completed SDR
2	Initiator B. Rubino	__	Metals: Doughty
__	Lab Manager: M. Taylor	__	Inorganic: Perrone
1	Project Mgr: Stone/Carey/Johnson	__	GC/LC: Pastor
__	Section Mgr: Wesson/Daniels	__	MS: Layman/Rycklak
X	QA (file): Schrenkel	__	Log-in: Keppel
__	Data Management: Feldman	__	Admin: Soos
__	Sample Prep: Bickel/Kauffman	__	Other: _____

L-WI-006/E-08/00

GLOSSARY OF VOA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF VOA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Recra LabNet - Lionville Laboratory

Volatiles By GC/MS, Special List — Report Date: 01/19/01 14:51

RFW Batch Number: **0012L587** Client: **TNUHANFORD B99-029 H1187** Work Order: 10985001001 Page: 1a

	Cust ID:	B11335	B11335	B11335	B11336	VBLKJJ	VBLKJJ BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	00LVX547-MB1	00LVX547-MB1
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOIL	SOIL
	D.F.:	1.00	0.926	1.00	1.04	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Recovery	1,2-Dichloroethane-d4	96 %	91 %	91 %	91 %	95 %	93 %
	Toluene-d8	155 * %	129 %	137 %	161 * %	103 %	98 %
	Bromofluorobenzene	73 %	73 %	79 %	69 %	91 %	91 %
Trichlorofluoromethane		5 J	11	7 J	3 J	5 U	5 U
Methylene Chloride		69 B	48 B	63 B	56 B	9	9 B
Chloroform		7 J	4 J	4 J	8 J	5 U	5 U

	Cust ID:	VBLKFG	VBLKFG BS	VBLKJP	VBLKJP BS
Sample Information	RFW#:	00LVX548-MB1	00LVX548-MB1	00LVX550-MB1	00LVX550-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Recovery	1,2-Dichloroethane-d4	85 %	94 %	91 %	98 %
	Toluene-d8	90 %	92 %	99 %	102 %
	Bromofluorobenzene	80 %	80 %	89 %	94 %
Trichlorofluoromethane		5 U	5 U	5 U	5 U
Methylene Chloride		7	8 B	5	5 B
Chloroform		5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

3B

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNet.Philadelphia Contract: 10985-001-001-9999-00

Lab Code: RECRA Case No.: SAS No.: SDG No.: 12L587

Matrix Spike - EPA Sample No.: B11335 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	102.20	0.0000	110.99	109	59-172
Trichloroethene	102.20	0.0000	107.75	105	62-137
Benzene	102.20	0.0000	105.05	103	66-142
Toluene	102.20	0.0000	148.60	145*	59-139
Chlorobenzene	102.20	0.0000	101.63	99	60-133

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	110.38	114.83	104	5	14	61-145
Trichloroethene	110.38	105.07	95	10	14	71-120
Benzene	110.38	105.84	96	7	11	76-127
Toluene	110.38	146.20	132*	9	13	76-125
Chlorobenzene	110.38	102.54	93	6	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 2 out of 10 outside limits

COMMENTS: _____

3B
SOIL VOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet.Philadelphia Contract: 10985-001-001-9999-00

Lab Code: RECRA Case No.: SAS No.: SDG No.: 12L587

Matrix Spike - EPA Sample No.: VBLKJJ Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	BLANK CONCENTRATION (ug/Kg)	BS CONCENTRATION (ug/Kg)	BS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	50.000	0.0000	41.792	84	59-172
Trichloroethene	50.000	0.0000	49.202	98	62-137
Benzene	50.000	0.0000	48.513	97	66-142
Toluene	50.000	0.0000	50.099	100	59-139
Chlorobenzene	50.000	0.0000	49.025	98	60-133

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 5 outside limits

COMMENTS: _____

3B
SOIL VOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet.Philadelphia Contract: 10985-001-001-9999-00

Lab Code: RECRA Case No.: SAS No.: SDG No.: 12L587

Matrix Spike - EPA Sample No.: VBLKFG Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	BLANK CONCENTRATION (ug/Kg)	BS CONCENTRATION (ug/Kg)	BS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	50.000	0.0000	41.171	82	61-145
Trichloroethene	50.000	0.0000	48.613	97	71-120
Benzene	50.000	0.0000	48.357	97	76-127
Toluene	50.000	0.0000	48.064	96	76-125
Chlorobenzene	50.000	0.0000	45.620	91	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 5 outside limits

COMMENTS: _____

3B
SOIL VOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet.Philadelphia Contract: 10985-001-001-9999-00

Lab Code: RECRA Case No.: SAS No.: SDG No.: 12L587

Matrix Spike - EPA Sample No.: VBLKJP Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	BLANK CONCENTRATION (ug/Kg)	BS CONCENTRATION (ug/Kg)	BS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	50.000	0.0000	43.617	87	61-145
Trichloroethene	50.000	0.0000	49.176	98	71-120
Benzene	50.000	0.0000	50.222	100	76-127
Toluene	50.000	0.0000	50.740	101	76-125
Chlorobenzene	50.000	0.0000	50.122	100	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 5 outside limits

COMMENTS: _____

RECRA LabNet Use Only: 00126587

Custody Transfer Record/Lab Work Request

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - Hanford B99-029

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spc Del: Std TAT: 30 day

Date Rec'd: 12-15-00 Date Due: 1-14-01

Account #:

	A	B					C		D
Refrigerator #	1	6					6		6
#/Type Container – Liquid									
#/Type Container – Solid	1ag	1ag					1ag		1ag
Volume – Liquid									
Volume – Solid	250	250					500		250
Preservatives	—						—		
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb	TCLP leachates		INORG: ICP Metal	CN	Anions
RECRA LabNet Use Only	OLC24X	OLC25X			Met①		ITCLP		ICNO3

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Met①	ITCLP	ICNO3
001	B11335			SO	12/13/00	0828	X	X		X	X
002	B11336			SO	12/13/00	0840	X	X		X	X
003	B11335 tclp of 001			L	*	–			✓		
004	" 6 " 002			"	"	–			✓		

Special Instructions:

DATE/REVISIONS:
Met① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni
* 2. See labchron
3.
4.
5.
6.

RECRA LabNet Use Only
Samples were: 1) Shipped ✓ or Hand Delivered ___
Airbill # See Below
2) Ambient or Chilled (circled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.0 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
FedEx	D Smith	12/15/00	10:00	COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 4235 7954 1323

(3)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-029-64	Page 1 of 1

Collector Fahlberg	Company Contact T Pickett	Telephone No. 373-4630	Project Coordinator TRENT, SJ
Project Designation 100-KR-4 Pump & Treat - Resin Sampling	Sampling Location 100-KR-4		SAF No. B99-029
Ice Chest No. ERC 99267 (1 of 1)	Field Logbook No. EL 1517-1	COA R10KR4C560	Method of Shipment Fed EX
Shipped To TMA/RECRA	Offsite Property No. A010179		Bill of Lading/Air Bill No. 423579453-1323

Price Code 9N

Air Quality ☐

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
** Historical data indicates that samples are less than 2000 pCi/g total activity.

Preservation	None	None	None	None	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	60mL	120mL	250mL	250mL	250mL	500mL		
SAMPLE ANALYSIS	~~Isotopic plutonium~~	~~Strontium-89,90 - Total~~ Sr	~~Technetium-99~~ RT 12-14-00	~~Tritium - H3~~	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate)	See item (1) in Special Instructions.	IC Anions - 300.0 (Nitrate)	See item (2) in Special Instructions.		

Sample No.	Matrix *	Sample Date	Sample Time										
B11335	OTHER SOLID	12/13/00	0828					X	X	X	X		
B11336	OTHER SOLID	12/13/00	0840					X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	1020 12-13-00	~~Received By~~ Stored in Ref 3-B	1020 12-13-00
Removed from Ref 3B 3728	0815 12-14-00	R. Thewer / R. Thewer	0815 12-14-00
R. Thewer / R. Thewer	0815 12-14-00	FEDEX	
FedEx	12-15-00 / 10:00	D. Smith	12-15-00 / 10:00

RT 12-14-00

SPECIAL INSTRUCTIONS

(1) VOA - 8260A (TCL) (Chloroform, Methylenechloride); VOA - 8260A (Add-On) (Trichloromonofluoromethane)
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Metals by ICP (TCLP) Add-on - 1311/6010 (Antimony, Beryllium, Nickel)

Samples stored in Ref.# 3B at the 3728 Shipping Facility on 12/13/00
Collector not available to relinquish samples on 12/14/00 for shipment.
RT 12/14/00

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 12.15.00 / 10:00

SDG#: CC12L587

Work Order Number: _____ SAF# B99-029

Shipping Container ID: ERC 99.007 Chain of Custody # B99-029-64

1. Custody Seals on shipping container intact? Yes [Y] No [ ]
2. Custody Seals dated and signed? Yes [Y] No [ ]
3. Chain-of-Custody record present? Yes [Y] No [ ]
4. Cooler temperature 20°C
5. Vermiculite/packing materials is Wet [ ] Dry [Y]
6. Number of samples in shipping container: 8
7. Sample holding times exceeded? Yes [ ] No [Y]

8. Samples have:
   - ____ tape
   - ____ hazard labels
   - ✓ custody seals
   - ✓ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [ ]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: [signature] / BECTEL Date: 12.15.00

Telephoned to: _____ On _____ By _____